

NOTES ON THE RUTACEÆ OF THE AUSTRALIAN  
ALPS.

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The remarks of Dr. Woolls on the varieties of *Crowea saligna* var. *exalata*, have induced the writer to offer the following notes on the regional distribution of the Rutaceæ over the Australian Alps. That there should exist on the highest peaks of these mountains representatives of an order whose geographic range extends over the hotter and temperate regions of the world, is perhaps a matter of general interest to students of botany. The whole of the species growing over the Australian Alps are endemic, and are comprised in the tribe *Boroniæ* of the 'Genera Plantarum.'

## ZIERIA SMITHII, Andr.

Of seven species of this interesting genus recorded by Baron Mueller in his 'Systematic Census of Australian Plants,' (six of which are found in New South Wales territory), I have identified only one, apparently the var. *macrophylla*, a Tasmanian form. It is an arborescent species which attains its greatest luxuriance in shaded heads of gullies at sub-alpine stations, generally between 2,000 and 4,000 feet above sea level. On the whole, it seems to flourish best over areas where Silurian sediments form the geological formation, as towards the heads of the Mitchell River and its tributaries in Gippsland, Victoria. At this habitat the flowers have an overpowering but agreeable aroma, while the crushed leaves and bark are exceedingly fœtid. The only slight differences which I have observed in the characters of this species, when comparing specimens procured at different altitudes and from

different situations as regards humidity, dryness, &c., consist in the thickness of the leaves, and in their being covered (in the sub-alpine varieties) with a dense stellate down on the underside ; the petals are also more tomentose, the flowers larger, and the branches more frequently covered with prominent glandular tubercles.

According to Bentham and Mueller, (1) this species has an extensive territorial range along Eastern Australia, from Queensland to Tasmania.

*BORONIA ALGIDA*, F. v. M.

According to the authors of the 'Flora Australiensis,' the genus *Boronia* is limited to Australia. Of 58 species admitted by Baron Mueller in his 'Census,' more than half (35 species) flourish in Western Australia, while in the other colonies the numerical proportions are as follows :—

North Australia and Queensland.....	20	species.
New South Wales.....	13	„
Victoria.....	8	„
South Australia.....,.....	7	„
Tasmania..... ..	7	„

So far as I am aware, there are only two distinct species in the Australian Alps, one of which is restricted to the highest elevations and is a very stable species, while the other extends over all elevations, and is a very variable one. The former (*B. algida*,) is a small dwarfed undershrub, found on the summits of most of the highest peaks from Mount Howitt to Mount Kosciusko, and apparently does not descend below 5,000 feet. As previously remarked elsewhere, "it appears to be governed in its distribution more by climatic conditions than by the character of the soil or geological formation." (2)

*BORONIA POLYGALIFOLIA*, Smith.

This ubiquitous species, which extends from Queensland through New South Wales and Victoria to South Australia and Tasmania,

(1) *Flora Australiensis*, Vol. I, p. 307.

(2) *Trans. Roy. Soc. Victoria*, 1884, p. 32. *Phanerogamia* of Mitta Mitta.

has also a wide altitudinal range over the Australian Alps, as from 1,000 feet in the Dargo Valley, Victoria, to the summit of Mount Kosciusko in New South Wales at elevations of 7,000 feet. From careful comparison of specimens obtained at different elevations and stations, as well as on different geological formations, I am inclined to agree with Baron von Mueller, that forms which have been ranked by other authorities as distinct species—as the *B. anemonifolia* of Bentham—have not sufficient claim to specific rank, being only differentiated forms of well-marked varieties. The division of the leaves into pinnæ in some forms, and the pubescence of others are not constant characters. And here I may be permitted to state that the result of my studies on the plants of the Australian Alps (and which I hope to be able to publish *in extenso* on some future occasion), harmonises strongly with the view “that existing species have arisen through the variation of pre-existing ones, and the destruction of intermediate varieties.” (3) The geological features lend additional strength to this view. And as remarked by the illustrious author of ‘The Flora of Australia.’ “If all these attributes of organic life which are involved in the study, classification, representation, and distribution, and which are barren facts under the theory of special creations, may receive a rational explanation under another theory, it is to this latter that the naturalist should look for the means of penetrating the mystery which envelopes the history of species, holding himself ready to lay it down when it shall prove as useless for the further advance of science, as the long serviceable theory of special creations, founded on genetic resemblance, now appears to me to be.” . . . . .

#### ERIOSTEMON.

This is a somewhat perplexing, and certainly very variable genus, in which Baron Mueller includes many species classed by Bentham under several genera in the ‘Flora.’ I incline to the Baron’s classification, because the species occurring in the Australian Alps

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(3) J. D. Hooker, *Flora of Australia*, p. 25.

are themselves so variable, that it is easily conceivable that there has been great differentiation of form over the different areas on which this class of plants flourishes throughout Eastern Australia.

I do not think that the characters upon which Bentham depends for the determination of generic, and in some cases for specific rank, are so constant as that eminent botanist believed them to be. I have frequently noticed that, even in the same plant, slight morphological differences may be seen ; hence if dried herbarium specimens from different localities were handed to a botanist for critical examination, it is quite possible that minor and unimportant differences might receive marked attention as indicating supposed distinct varieties. I have elsewhere stated that climatic conditions have exerted a dominating influence in the production of varietal forms, *i.e.*, within the range of my limited observation on the flora of the Australian Alps. Further more extensive examinations of the geological structure of the area, and the correlated vegetation have confirmed me in this opinion. It remains to be seen whether more extended comparisons with the floras of other alpine areas will either prove or disprove this hypothesis.

ERIOSTEMON PHYLICIFOLIUS, F. v. M.

This dwarf shrub, which Bentham has separated from the genus *Eriostemon* into *Phebalium*, and described as *P. phyllicifolium*, is almost restricted to the higher points of the Australian Alps, as on the quartz porphyries (Devonian) of Mount Cobberas, and the metamorphic schists of portion of Bogong High Plains. The lowest elevation at which I have seen it is on the quartz porphyry near Mount Sisters at 3,000 feet.

ERIOSTEMON OZOTHAMNOIDES, F. v. M.

On the banks of the Mitta Mitta at Hinnomunjee (1,600 feet), this shrub attains a height of 12 feet. It ascends, along the margin of the western Mitta Mitta tributaries, to elevations of 5,000 feet, but becomes stunted, and acquires the habit of *E. phyllicifolius* at the higher elevations. This is also included by Bentham in the genus *Phebalium*.

## ERIOSTEMON ALPINUS, F. v. M.

This is identical with the *P. squamulosum* var. *alpinum* of Bentham ; and although stated by that authority to have a considerable range in New South Wales, as from Port Jackson to the Blue Mountains, Liverpool Plains, Clarence River, &c., it is certainly here restricted to some of the higher peaks of the Australian Alps, such as Mount Pelot, 6,000 feet, Mount Bogong, 6,500 feet, &c. I have seen specimens with more coriaceous leaves on the summit of the mountain in northern aspects, and others on the southern slope, which answered fairly to the typical description given by Bentham.

## ERIOSTEMON OVATIFOLIUS, F. v. M.

I have obtained specimens of this much branched shrub from the stony ridges towards the summit of Mount Kosciusko on the intrusive granite areas, at an elevation of 7,000 feet above sea level ; it extends westerly, on the summits of the highest mountains, to the sources of the Macalister River. I have not observed any forms below 5,000 feet. It is identical with *Phebalium ovatifolium* of Bentham.

## ERIOSTEMON CORREIFOLIUS, F. v. M.

This species is not only separated as a distinct genus (*Asterolasia*) by Bentham, but two well-marked varieties, one a lowland form, and the other sub-alpine, have been described as distinct species (*A. correifolia*, and *A. Muellerii*). I believe the difference in the characters to be variable and inconstant, and entirely due to habitat ; *A. Muellerii* occurring, as stated, in deep ravines of the granitic Buffalo Mountains and other localities, and *A. correifolia* at Port Jackson and Parramatta. Bentham directs attention to the fact that "the curious tendency to an increase in the usual number of stamens is observable in some species of both sections ;" *i.e.*, the two sections into which he proposes to divide the species of *Asterolasia*.



## ERIOSTEMON TRYMALIOIDES, F. v. M.

This rigid dwarfed shrub has also been placed by Bentham in *Asterolasia*. Its habitat is that already mentioned by Baron Mueller, and it is governed more by climatic conditions than by differences of soil, the species flourishing equally well on the Silurian slates of Mount Hotham, the gneiss of Mount Bogong, the basalt of Bogong High Plains, and the granite of Mount Kosciusko ; 5,000 feet is apparently the lowest altitudinal limit at which it flourishes.

## ERIOSTEMON CROWEI, F. v. M.

Dr. Woolls has directed my attention to this species, and from the sample of *C. exalata*, which he was good enough to send me—obtained I believe in the Blue Mountains—I am inclined to support the view of Baron Mueller, that *C. exalata* is merely a variety of *C. saligna*. I have obtained specimens on the granitic (metamorphic) area at the junction of Cobungra and Big Rivers (Mitta Mitta Valley), which are specifically identical with the sample sent from the Blue Mountains. Although Bentham has placed this species in a separate genus, *Crowea* (Sm.), I adhere to Baron Mueller's classification as given in his 'Census.' The differences in general habit, foliage, and inflorescence referred to by Bentham in the 'Flora Australiensis,' are, in my opinion, due to differences of habitat. Altogether this is a most variable species. I have observed very important differences in the foliage and flowers of the same plant. It ascends to elevations of 4,000 feet in the Australian Alps.

## ERIOSTEMON TRACHYPHYLLUS, F. v. M.

This tall shrub attains a height of 20 feet, with a trunk 6 inches in diameter, in the Wentworth Valley towards Gippsland. In some places it is the principal vegetation, covering the sunny slopes of the steep ridges (Silurian), to the exclusion of other vegetation. The wood is extremely fine-grained and dense, not unlike box-wood.

## ERIOSTEMON MYOPOROIDES, De Cand.

The localities given in the 'Flora' are those where this shrub flourishes. I have not seen either New South Wales or Queensland specimens for comparison with the sub-alpine form. The glandular tubercles are extremely prominent in the local form, and the flowers pinkish in colour.

## CORREA AEMULA, F. v. M.

Of the five species of *Correa*, four of which flourish in South Australia, four in Victoria, three in Tasmania, three in New South Wales, and one in Queensland, there are only three found in the Australian Alps—two lowland species struggling to higher elevations, and one a distinctly sub-alpine form. Of the former, *C. aemula* is found on the Devonian limestone area of Bindi in Tambo Valley, and *C. speciosa*, Ait., var. *cardinalis* in the Haunted Stream, also in Tambo Valley.

## CORREA LAWRENCIANA, Hook.

This species is common at sub-alpine habitats all over the area, particularly towards Gippsland. It ascends to elevations of 4,000 feet, and is quite distinct from *C. speciosa*.